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PETROLEUM LOGISTICS

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PETROLEUM LOGISTICS

By

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Petroleum - truly the life blood of our Armed Forces. The challenging speed, dispersion and mobility requirements of present day military tactics hinge primarily on petroleum as the source of propulsion. The vital importance of oil as the life blood of our fighting forces, the resource constraints, and the impact of the tremendous military expenditure of funds for petroleum on our national economy dictate the most economical, militarily responsive, petroleum logistic system possible - does our existing system meet these criterion?

The author arrives at the conclusion that the system is militarily responsive and dependable but suggests that greater economy could be achieved without losing these characteristics by total integration of the now separate Service petroleum logistic functions under one agency.

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PETROLEUM LOGISTICS

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In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Management

by

Raymond J. Pluto, Lieutenant Commander, SC, USN

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INTRODUCTION

Petroleum - truly the life blood of our Armed Forces. Never before in our National Defense has a single commodity been so vital both to the conduct of military operations and to the industrial economy that must support it.

History has shown that the degree of success of a military operation is in direct proportion to the adequacy of its petroleum supply. Significant in this regard was the confession of the German military strategist, General Ludendorff, who in his memoirs stated, "It was chiefly because of insufficient oil reserves in World War I that Germany was forced to sue for peace in November, 1918." Additionally, Winston Churchill remarked, "The allies had literally floated on a sea of oil to victory in World War II;" and finally, the importance of petroleum in modern war and the effect of petroleum supply on strategy is well illustrated in the testimony of Admiral Togoda (Chief, Naval Combined Forces, Japan) to the effect that "Japanese loss of tankers and oil resources precluded further large scale Naval operations against the United States in 1945."

The challenging speed, dispersion, and mobility of present day military tactics hinge almost exclusively

on use of petroleum consuming machines. Even the advent of fissionable energy sources and formidable global ballistic missiles in the military arena has not stemmed the ever-growing demands for petroleum. Military planned procurement in 1965 is expected to increase approximately 15,000,000 barrels over the requirements for Fiscal Year 1961.¹ During 1961, deliveries were at a peace time high of 722,000 barrels per day as compared with peak mobilization consumption during World War II of 1,500,000 barrels per day.²

Impressive as these facts appear, of greater significance is the staggering petroleum requirements in the event of another war. Captain J. M. Boyd, USN, speaking before the Canada-United States, Permanent Joint Board on Defense in August, 1948, estimated, "All of the probable military requirements for petroleum products when added together will be in the vicinity of 9 to 10 million barrels per day"³ --

¹Clyde La Motte, "Military Fuel Demand is Going Up Again," The Oil and Gas Journal, October 30, 1961.

²John H. Morse, J., Captain, USN, "Petroleum," Naval War College Review, Vol. V, No. 7, March, 1953.

³Bureau of Naval Personnel, Petroleum Logistics, NAVPERS 10892, Department of the Navy, 1955, p. 8.

at an annual military expenditure rate of 6 billion dollars a year.

From this sobering discussion emerges the fact that the limiting factor in the development of our military defense system is economics -- economics which deals with the allocation of scarce resources. We must seek to improve our national defense by the means of increasing the effectiveness of this allocation process.

The approach of this paper is to give broad coverage to the many aspects of military petroleum logistics, Navy oriented. Included are the milestones and concepts that form the evolution of the petroleum logistic system, the petroleum organizations and their related functions, and finally an analysis of the existing petroleum logistic system itself.

The vital importance of oil as the life blood of our fighting forces, the resource constraints, and the impact of the tremendous military expenditure of funds for petroleum on our national economy dictate the most economical, militarily responsive, petroleum logistic system possible - does our existing system meet these criterion?⁴

⁴As a point of reference, the existing system is considered to include the period up through 30 December 1961 encompassing the Military Petroleum Supply Agency, and the Unified Command, Joint Petroleum Logistics Organization.

CHAPTER I

EVOLUTION OF THE PETROLEUM LOGISTIC SYSTEM

Early 1900 developments

At the turn of the century the United States Navy was excited about the experimentation of oil burning equipment for ship propulsion. Perhaps the greatest hindrance to the assured development of such equipment and eventual installation in all Naval ships was the UNCERTAINTY of the source of fuel oil supply. The oil industry was in its infancy and not much was known about how much oil the United States could produce and for how long. Even if plenty of oil were available another large problem loomed on the horizon -- the problem of distribution as oil could not be obtained for naval ships in all ports of call.

The results of oil-fired propulsion were so enthusiastically received that the Secretary of the Navy in 1914 announced in his annual report for 1914, "In the future, all fighting ships built for the Navy would burn oil solely." As time passed, more and more ships were built, or converted, to burn oil; and the question of continued supply was raised more and more frequently. Finally, the Engineer-in-Chief of the Navy in a letter to the Secretary of the Navy dated 15 April 1916 stated:

The question of the supply of fuel oil for the fleet is of such great importance that the Bureau believes that it should be taken up and seriously studied at once in order that the necessary information may be had as to the cheapest fuel oil that may be used, the quantity and location of storage that should be provided, the methods that should be adopted for providing the current supply, and the plans that should be formulated and followed in order that the Navy may be assured of an adequate future supply and in order that the Navy Department may intelligently and safely continue its policy of building oil-burning vessels.

On the matter of future oil availability, the same letter indicated:

The Department of the Interior estimates that there remains in the oil fields of the nation a supply for only twenty-five years, and a recognized authority on this subject states:

In the exhaustion of its oil lands and with no assured source of domestic supply in sight, the United States is confronted with a national crisis of the first magnitude -- we must either plan for the future or we must pass into a condition of commercial vassalage, in time of peace relying on some foreign country for the petroleum where-with to lubricate the highways of commerce, in time of war at the mercy of the enemy who may either control the source of supply or the means of transportation.¹

This letter had immediate effect. The establishment of Naval Petroleum Reserves and government withdrawal, from public entry and settlement, of certain

¹Hamilton, J. E., Lieutenant, USN, "A Short History of the Naval Use of Fuel Oil," Journal of the American Society of Naval Engineers, August, 1933.

large land areas in known oil producing areas in California and Wyoming reasonably assured the Navy of its continued oil supply. To solve the problem of distribution the Navy shortly thereafter began construction of storage tanks, tankers, barges and terminal facilities, strategically located to serve the needs of the fleet.

Thus from the beginning of the oil era in the Navy, the Navy had been beset with problems of oil supply, and had the attendant distribution problems associated therewith.

World War 1 to 1941

During World War I sufficient oil was obtained and distributed to meet the needs of the fleet. However, at this time, mechanized warfare and military aircraft took on new importance with resultant large demands for petroleum fuels. This began the independent, non-related procurement competition by the Services to obtain their requirements of petroleum. The Services established and maintained their own separate petroleum logistic systems including purchase responsibility, distribution, and bulk terminal operation. In the years to follow, mounting United States oil reserves and industry refinery capability were such that neither the government nor the Armed Forces were much

concerned for their petroleum supply. The Navy had expanded its strategically located terminals and developed a vast network of bulk terminal facilities worldwide and fueling at sea had met with considerable success.

With the situation as favorable as it was it is no wonder that the Armed Forces approached World War II with a certain amount of complacency with regard to procurement and distribution of petroleum.

Military coordinated efforts after 1941

Petroleum, being so vital to the military and civilian needs, has experienced extensive coordinating efforts since 1941. With the outbreak of World War II this indispensable commodity was singled out for coordinated control. Petroleum has since been among the forerunners in such amalgamated efforts of coordinated purchasing, joint purchasing, single service procurement and support situations of cross servicing, common servicing, and joint servicing.

A synopsis of the coordinated efforts after 1941 is as follows:

Petroleum Coordinator for National Defense --

Early in 1941 the Secretary of Interior was appointed the Petroleum Coordinator for National Defense with responsibility to "make petroleum available adequately and

continuously, in the proper forms, at the proper places to meet military and civilian needs."

Army-Navy Petroleum Board -- Services continued to purchase their own requirements until 1942. During the period 1941-42 the Services began to feel the pinch of procurement competition caused by increased military requirements, thus bringing about the need for coordination. The Army-Navy Petroleum Board (ANPB) was formed to consolidate requirements for purchasing with different Services assigned the purchasing responsibility for different products for all military requirements (coordinated purchasing). It is mentioned that ANPB itself was not a procurement agency as such, although its mission included the coordination of petroleum procurement as well as coordination of other petroleum matters such as overseas shipment and storage.

Joint Army-Navy Petroleum Purchasing Agency - The "Draper-Strauss" Report recommended that "Although the then War and Navy Departments were functioning adequately under the methods of coordinated procurement of single service purchase assignment, a joint central purchasing agency should be established because a centrally located direct line agency would provide further general advantages of simplicity,

expedited action and reduction of administrative overhead and personnel in contrast to duplicate functional agencies under different commands at different places." As a result of the Draper-Strauss Report, the Joint Army-Navy Petroleum Purchasing Agency (JANPPA) was established in 1945. With the establishment of the JANPPA, joint purchasing of petroleum products was accomplished by grouping petroleum purchasing sections of the Services into a single geographical location. Although this did not actually put a central procurement system into effect, a method of cross procurement was actually developed between the Services. This resulted in considerable savings, both in Government funds and time. The overall efficiency of this procedure was, however, limited by the extensive interservice transfer required between the procuring and consuming Services. JANPPA, as well as the ANPB, existed until the National Security Act of 1947 was passed, which eliminated the ANPB.

Armed Services Petroleum Purchasing Agency -

The Armed Services Petroleum Purchasing Agency (ASPPA) was created to overcome the deficiency of the JANPPA. In 1948, JANPPA became the Armed Services Petroleum Purchasing Agency with a Charter under the National Security Act of 1947 to procure Petroleum for all the Services. ASPPA then became a full-fledged joint

purchasing organization entailing a central procurement system on a joint Service basis for purchasing all military requirements (Joint Purchasing).

In addition to performing the functions of a purchasing agency, the ASPPA inherited the responsibilities formerly performed by the JANPPA. These did not include the significant inventory control tasks or the control of the distribution system which responsibilities were retained by the individual Services.

Military Petroleum Supply Agency - In 1956 the Military Petroleum Supply Agency (MPSA) was formed as one of the four original Single Manager Operating Agencies. MPSA was activated on 7 January 1957 as a means of improving the effectiveness and economy of petroleum supply and service operations throughout the Defense Establishment. ASPPA was then dissolved with MPSA assuming that agency's functions. The principal new responsibilities assigned to MPSA were to:

1. coordinate the petroleum distribution systems for the Department of Defense.
2. coordinate the positioning of mobilization reserves and operating stocks.
3. coordinate and promulgate Interservice supply support agreements.
4. coordinate the program for dispersion and protection of contract commercial storage facilities.
5. procure all the requirements for commercial petroleum services.

6. direct the procurement inspection program.
7. coordinate the cataloging activities of the military services.
8. coordinate the program of standardization.²

The organization structure showing these functions is shown on Chart 1, page 9. Although MPSA conformed to the concept of a Single Manager Operating Agency, several significant variations appear in the Charter which stated:

The scope of this assignment is limited to the extent that neither ownership nor funding by a single stock fund is provided for the management of petroleum and petroleum products. This deviation is justified by the characteristics of petroleum and the exceptional conditions encountered in the supply and distribution of this commodity by the military departments.³

Consequently, MPSA did not have responsibility for the computation of net requirements and did not exercise stock ownership. These functions, together with inventory control, remained the responsibility of the various Services.

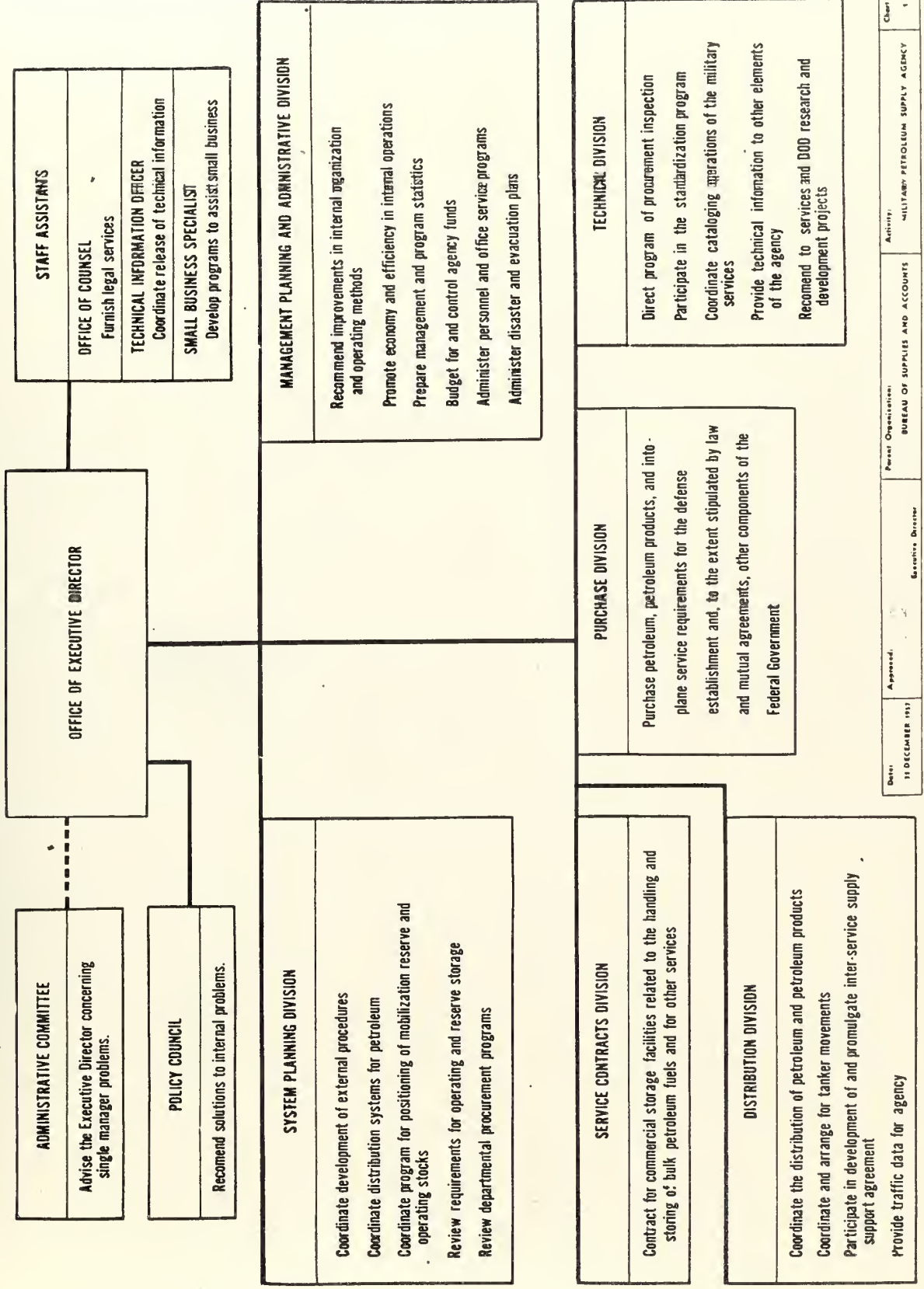
Throughout the history of fuel procurement, the various procurement organizations operated in somewhat a different environment than other commodity

²Military Petroleum Supply Agency pamphlet, Military Petroleum Supply, Department of the Navy, n.d. .

³Department of Defense Directive 5160.18, ASD (S&L). Single Manager Assignment for Petroleum. July 24, 1956.

CHART 1.

MILITARY PETROLEUM SUPPLY AGENCY Organization & Functions



groups in the supply field. They continually were required to work with groups in other Executive Departments concerned with petroleum because of its vital nature, large requirements for Defense, and the impracticability and inability to store large reserves.

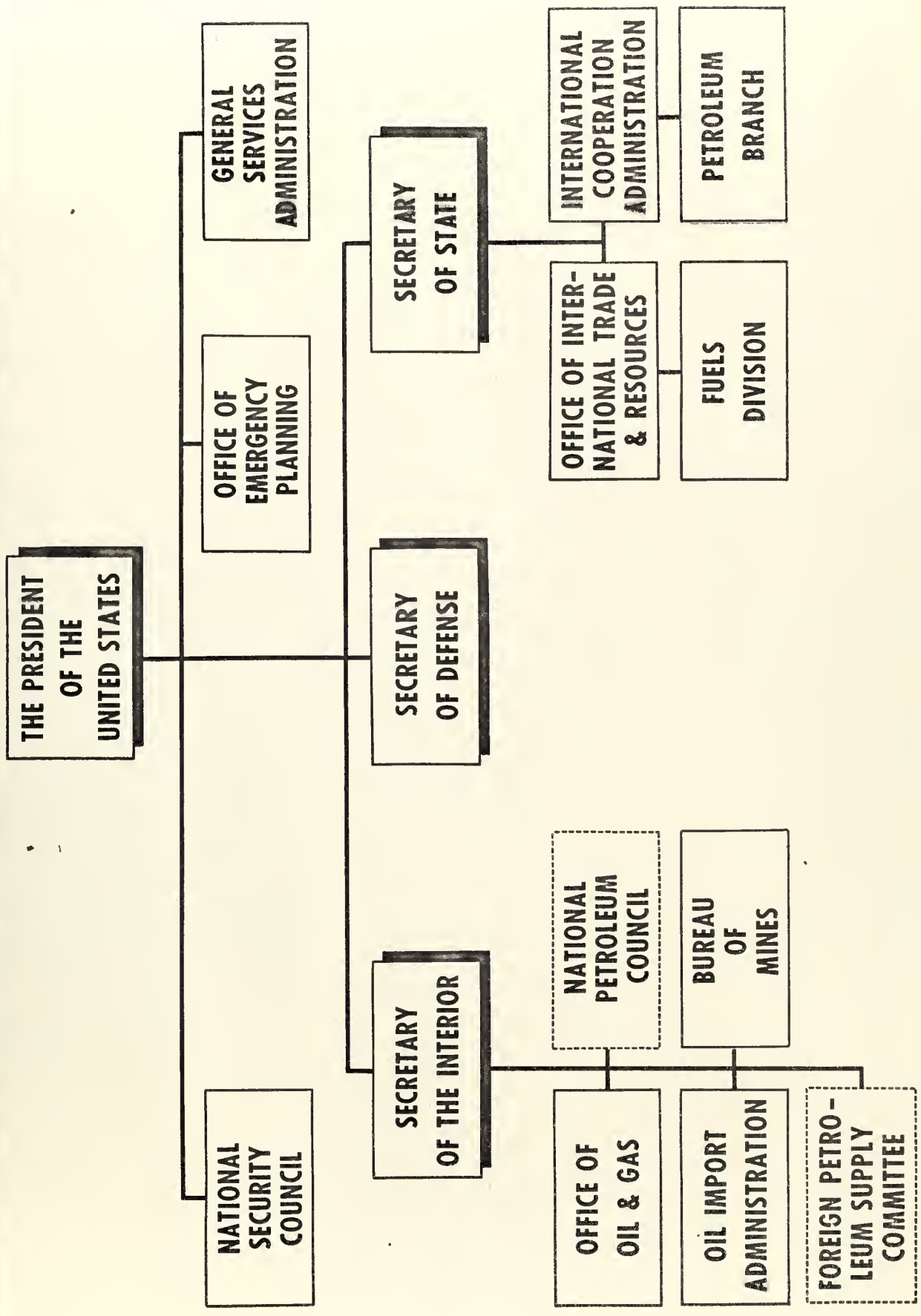
In advancing through the stages of independent, non-related, competitive procurement, single department purchasing assignment and joint purchasing, the military petroleum procurement system finally reached the Single Manager (Modified) plateau. These advances have not been without fanfare at each incremental rise. Just as now, the Service cries have been that the Commander must control his logistic system to insure responsiveness to command - authority commensurate with responsibility for the mission was and is the mainstay. The battle for authority has been bitter; integration progress incomplete. MPSA can be considered as an organization established historically by logical necessity, with valid basis, but with controlled growth evolution. With its modified Single Manager Charter, MPSA represented a compromise solution by the three Services to the problem of Military Petroleum Supply.

CHAPTER II

ORGANIZATIONS INVOLVING PETROLEUM LOGISTICS
AND THEIR FUNCTIONSGeneral

The essentiality of Petroleum to our National Defense efforts during peace and war, for both military and civilian economy, requires the closest attention and coordination at all levels of government. Vastly fluctuating demands during emergencies, with limited resources available suggests that positive, yet flexible, control system must be intact to provide sensible, equitable distribution to fill priority needs of the military, industry and civilian economy. In order to insure an integrated approach to the distribution of petroleum resources, many agencies are closely interwoven to this end with the Secretary of Interior being the focal point for the numerous petroleum matters of concern to the government. As a matter of reference, Chart 2, page 12, depicts the principal agencies concerned directly with petroleum. Generally speaking, the Office of Oil and Gas, within the Department of the Interior, concerns itself with coordination and unification of oil and gas policies of all Federal agencies and enlists their cooperation to assure adequate development, distribution and

U.S. GOVERNMENT PETROLEUM ORGANIZATION



utilization of petroleum resources and facilities to meet civilian, industrial, and military requirements in time of peace or national emergency.

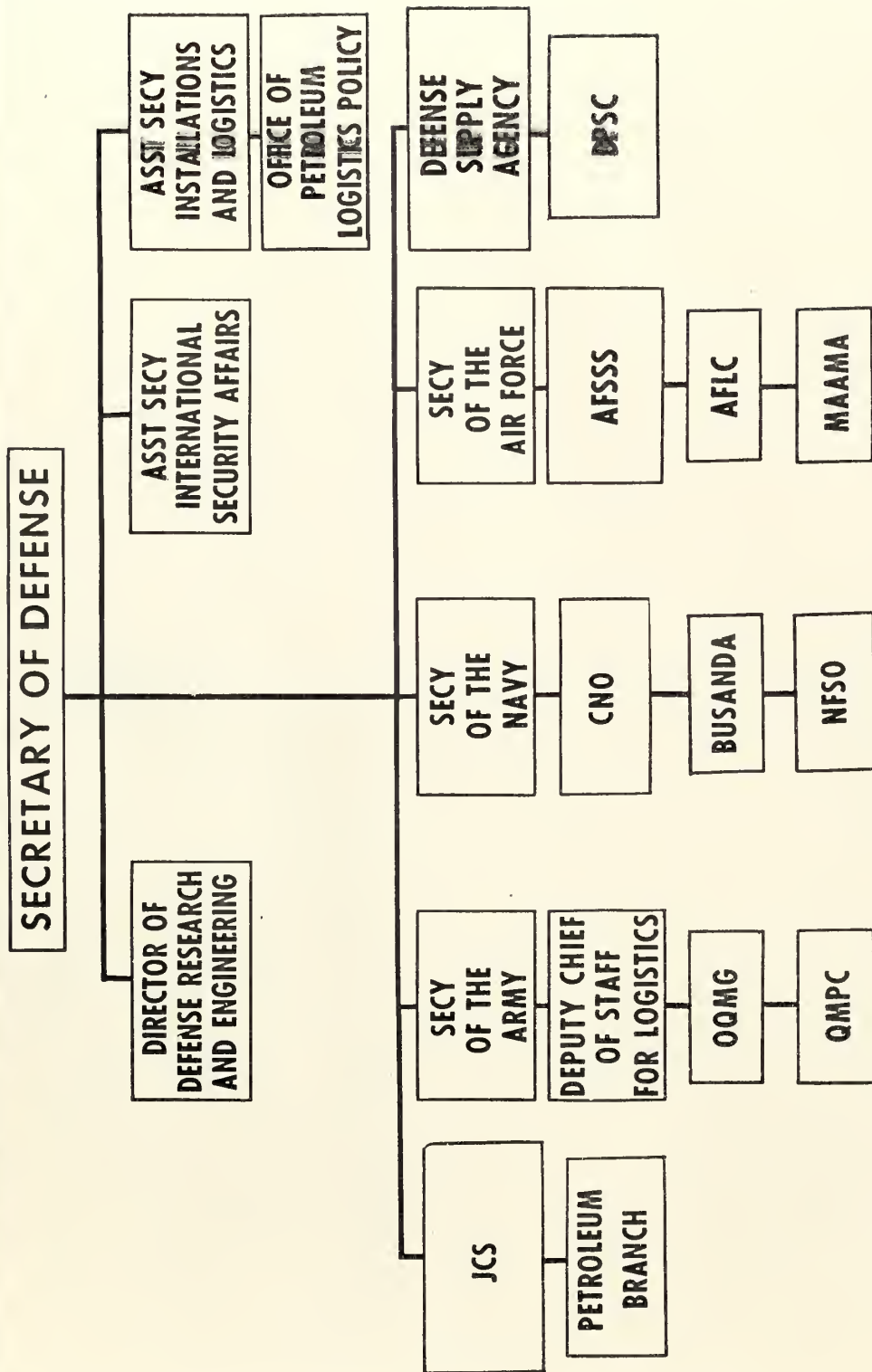
Other agencies and their principal functions are: the Department of State which is involved in the international aspects and developments of petroleum abroad; the Department of Defense concerns itself with matters pertaining to defense from a supply point of view and in terms of maintaining a broad economic base for defense mobilization; and finally, the General Services Administration purchases the petroleum products for the agencies of the United States Government other than defense requirements.

Chart 3, page 14, portrays the Department of Defense petroleum organization and in the discussion of military elements below only the responsibilities of these organization units pertaining to petroleum logistics are shown.

Assistant Secretary of Defense (Installations and Logistics)

The Assistant Secretary of Defense (Installations and Logistics) ASD(I&L) is responsible for advising and assisting the Secretary of Defense in the establishment of effective policies and systems for the efficient and economical operation of the DOD in the supply and logistic fields of procurement, production,

DEPARTMENT OF DEFENSE PETROLEUM ORGANIZATION



distribution, transportation, storage, cataloging, requirements and mobilization planning.

The Defense Reorganization Act of 1958 strengthened the position of SECDEF, in turn ASD (I&L) by granting specific authority to organize and operate common supply services without being subject to compromise or veto by the Services.⁴ This authority, as will be shown later, eventually served to pave the way for consolidation of common petroleum supply under DOD sponsorship. The authority itself stems from changes made in the preamble to the National Security Act of 1947 which stated, "To provide three military departments separately administered," to read, "To provide a Department of Defense, including three military departments," and further provided that these were to be "separately organized" rather than "separately administered."

Importantly, the Petroleum Logistics Policy Directorate of Assistant Secretary of Defense (I&L) is the DOD's key unit for petroleum policy and it happens to be the sole purely commodity organization within the Office of Secretary of Defense. This

⁴United States Congress, Joint Economic Committee, Economic Aspects of Military Procurement and Supply, Report of the Subcommittee on Defense Procurement, 86d Congress, 2d Session, October, 1960 (Washington: Government Printing Office, 1960), p. 110.

Division, based on JCS Strategic and Logistic Plans, forward planning assumptions and guidance to the Military Petroleum Advisory Board in the Department of Interior, which board is involved in determining the capability of industry to support war plans. In turn, the Petroleum Logistics Policy Directorate of OSD evaluates the Military Petroleum Advisory Board comments on support capability to determine if Strategic plans can be supported logistically.

Joint Chiefs of Staff Organization

The function of the JCS organization is basically to provide for formulation of military strategy and joint logistic plans and assignment of logistic responsibilities to the military departments in support of such plans.

Office of Naval Petroleum and Oil Shale Reserves

The mission of the office of Naval Petroleum and Oil Shale Reserves is to explore, prospect, conserve, develop, use, operate and administer the Naval Petroleum Reserves; administer the Naval Oil Shale Reserves; and serve as the principal Department of the Navy Advisory Office on matters relating to crude petroleum, both domestic and foreign. The Army and Air Force have no true counterpart of this office since they do not have any Petroleum Reserves per se.

Chief of Naval Operations

The Chief of Naval Operations is responsible for the logistic support of the Operating Forces of the Navy and such Navy component forces of Unified, or Specified Commands, as may be assigned by higher authority. Within the CNO organization, the Deputy Chief of Naval Operations, Logistic Plans Division, has the responsibility for the following specific functions relating to petroleum:

1. establishing world-wide levels of supply and mobilization reserve stocks of principal bulk products.
2. establishing the optimum quantities for storage at specific locations.
3. promulgating consumption factors.
4. coordinating the preparation and determination of requirements in terms of product and storage space necessary to support current and future plans.
5. preparing broad Navy policies and plans insofar as they affect the logistic support of the Naval Establishment.

Bureau of Supplies and Accounts

The Bureau of Supplies and Accounts is responsible for the procurement, funding, storage and issue of all

petroleum products required by the Navy. This function has been assigned to the Fuel Supply Office (FSO), which, acting as the designated Navy Inventory Control Point serves to assure the proper balance between the supply of and demand for items under its control. This mission of FSO relates to the three major logistic steps of:

1. computes net requirements for each product and determines when, and where needed.
2. procures requirements through MPSA.
Although MPSA negotiates the contracts, the FSO places orders with MPSA.
3. directs distribution of items purchased by MPSA for the Navy (packaged only).

In exercising inventory control, FSO establishes minimum and maximum stock levels of supply for the various items; interprets and processes stock status reports; analyzes operating data to effect replenishment of bulk and packaged stocks within continental United States; and also determines and initiates disposal action for excess stocks.

Navy bulk fuel terminal facilities throughout the world are financed by BuS&A and are under its management and technical control, this control being exercised by the Fuel Supply Office. This office

recommends to the Assistant Chief of the Bureau for Supply Management the fuel-facility requirements for use in current, mobilization, and logistic code planning, based on directives from the Chief of Naval Operations. Requirements include data on locations, products to be stored, timing and relative priority of alterations, justification of new projects for construction, leasing, amount of additional storage required and the type of storage needed. The pattern of the responsibilities for the petroleum inventory control points of all three military departments are somewhat a mirror reflection of FSO's responsibility.

Military Sea Transportation Service - Prior to 1949 the Navy operated and maintained its own independent transportation service at sea. The Army did likewise to meet its own requirements and also those of the Air Force. With the advent of the Single Manager for Ocean Transportation in August 1949, the Military Sea Transportation Service (MSTS) has since been responsible for the sea transportation of bulk petroleum for the entire Department of Defense. The transportation function of MSTS is considered to be an integral part of the overall logistic operation within the Navy and is designed to be responsive to logistic support requirements. The extent of tanker movement costs for fiscal year 1958 was approximately

\$98,000,000 to lift \$417,000,000 of bulk petroleum products. MSTIS accomplishes this delivery through:

1. a nucleus fleet of Navy owned, Navy manned oilers and Navy owned tankers which are contract manned and operated.
2. industry furnished tankers through the Voluntary Tanker Plan. This plan was developed to meet emergency situations by industry to preclude the necessity of Government seizure of tankers in a market of ever diminishing availability during crises periods.

Joint Petroleum Office - During World War II over 60 per cent of the total material shipped overseas was comprised of petroleum products.⁵ This volume was so great within the various theaters that the then Army-Navy Petroleum Board found it essential to have some system of coordinating these requirements, delivery thereof, and facilities for handling. As a result, Area Petroleum Offices - later designated as Joint Petroleum Offices (JPO) - were established on the staff of each theater commander for the staff supervision of all petroleum matters within the geographical command area.⁶

⁵Bureau of Naval Personnel, op cit., p. 1.

⁶Ibid, p. 48.

The functional JPO organization has been so effective that it still exists today. The JPO serves as the focal point for theater petroleum logistics.

Typical functions include:

1. coordinating logistic policy and planning in conjunction with MPFA and the Military Departments concerned.
2. consolidating theater peacetime requirements and formulation of replenishment program and distribution system consistent with those requirements.
3. coordinating the quality surveillance program within the unified command.
4. allocations programming under emergency conditions.
5. monitoring the prescribed service levels of major items to insure adequacy of stocks.

JPO's are jointly staffed by Military personnel on an equal basis from each military service having a mission in the area. These personnel are integrated within JPO without regard to the service they represent.

Sub Area Petroleum Offices - The last petroleum logistic organization to be mentioned is the overseas Sub Area Petroleum Office (SAPO) which functions as an extension of the JPO organization at a lower

operational level within the Unified Command. SAPO's have one important distinction, however, and that is they are directly involved with the day to day petroleum operations at the end of the pipe line.

Generally, the Sub Area Petroleum Office compiles requirements for both bulk and packaged products for all three Services for submission to the area JPO and furnishes guidance on the disposition of excesses or on meeting shortages generated by the various Services at the working level.

CHAPTER III

ANALYSIS OF THE PETROLEUM LOGISTIC SYSTEM

Single Manager Plan

The culmination of the petroleum coordinated efforts of the military after 1941 resulted in adoption of the Single Manager Plan for Petroleum. The primary objectives of the plan were said to be to:

1. eliminate duplication and overlapping of effort between and among the military departments.
2. improve the effectiveness and economy of supply and service operations throughout the Department of Defense.¹

These objectives, of course, were now new; they are reflections of the goals of single service procurement, joint purchasing assignment and coordinated procurement programs. Perhaps the most strikingly, distinctive feature of the Single Manager Plan was to vest in a single Military Department, responsibility for procurement, stock maintenance, and distribution of a selected commodity for all military users.

¹Department of Defense Directive 5160.12.
Policies for Implementation of Single Manager Assignments, January 31, 1956.

The proposed DOD charter for Petroleum Single Manager provided that all Service wholesale stocks of petroleum would be capitalized, and that the Single Manager would then perform all procurement, manage inventory stocks, and sell through the usual stock funding arrangements to the retail level of Service users. A three-way split in Service recommendations to the proposed charter developed, as follows:

The Air Force opposed any change in stock ownership, basing its argument on the necessity of maintaining continuous control of its Mobilization Reserves; the Army proposed to limit agency stock ownership to the continental United States; the Navy proposed that the agency's stock ownership extend to certain overseas stocks.²

As indicated elsewhere in this study this wide divergence of opinion served to modify the Petroleum Single Manager Charter to exclude stock ownership and distribution. Because of the compromise of the Single Manager concept in the creation of MPSA and its inability to handle many distribution problems with limited authority, recent findings of the Logistics Systems Study Project Team (LSSP) commented, "there was in fact no Single Manager for Petroleum in the Department of Defense."³ This statement is amplified by the two

²U. S. Congress, House of Representatives, Committee on Government Operations. Military Supply Management, Hearings before Subcommittee, 86d Congress, First Sess. May 25 and 26, 1959, (Washington: Government Printing

charts 4. and 5., pages 26 and 27, which show graphically the difference between the intended Single Manager Plan and the actual limited extent of MPSA's operation.

Further findings on the shortcomings in petroleum supply operations as presented in a report by the LSSP team in December 1957 revealed:

overstocking; duplication of stocks at one or more sources; procurement of items already in long supply; duplication of facilities and procurement of items held by another Service as excess.⁴

These deficiencies, too, can be attributed to the separate uncoordinated, Service inventory control and distribution systems.

Logistic Processes

Necessary to an evaluation of the existing petroleum logistic system stated in the Introduction, is an identification and discussion of the three major steps of the logistic processes, namely:

1. determination of requirements,
2. procurement,
3. distribution.

Only those factors within each of these main broad steps considered germane to this paper will be presented.

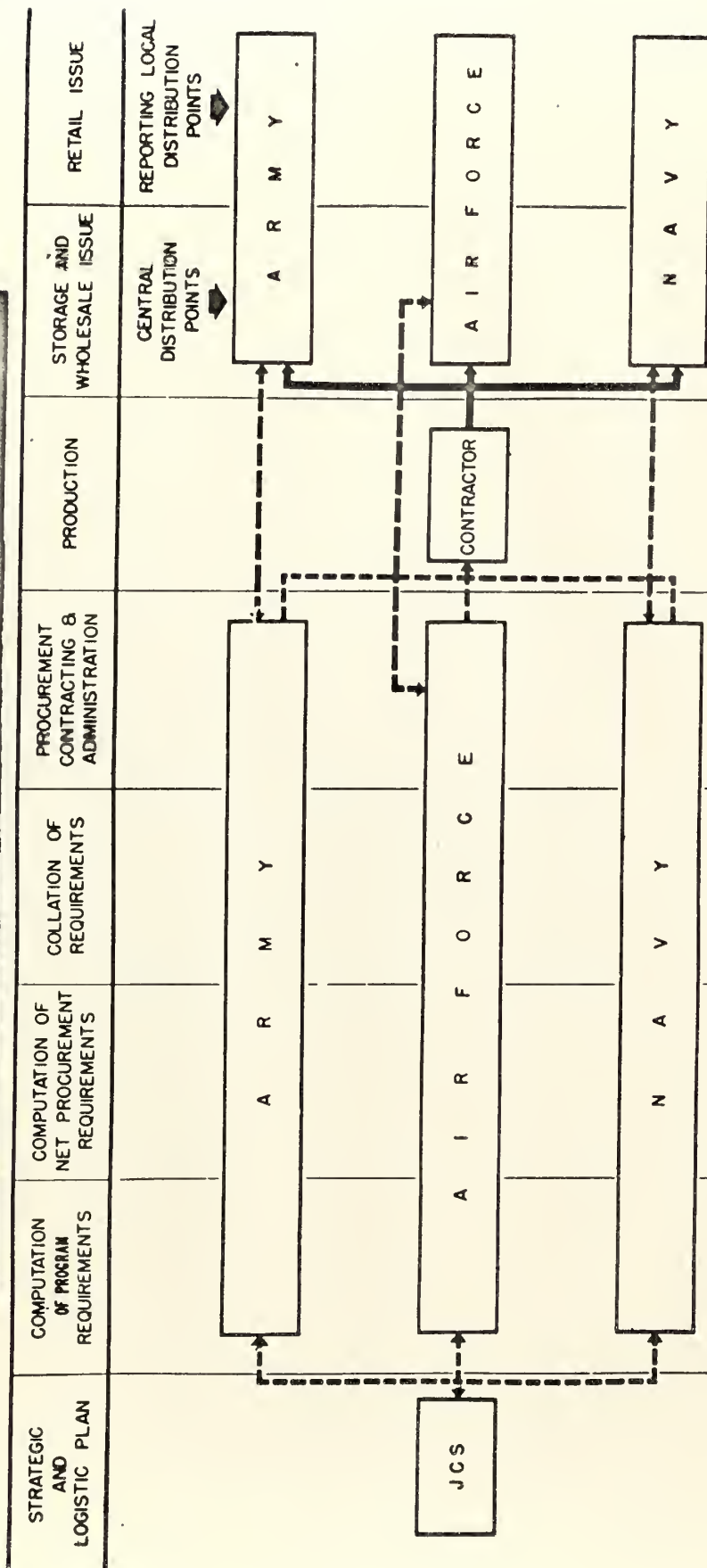
Office, 1959), p. 29.

³Ibid, p. 513.

⁴Ibid, p. 31.

THE SUPPLY SYSTEM

PRIOR TO SINGLE MANAGER CONCEPT



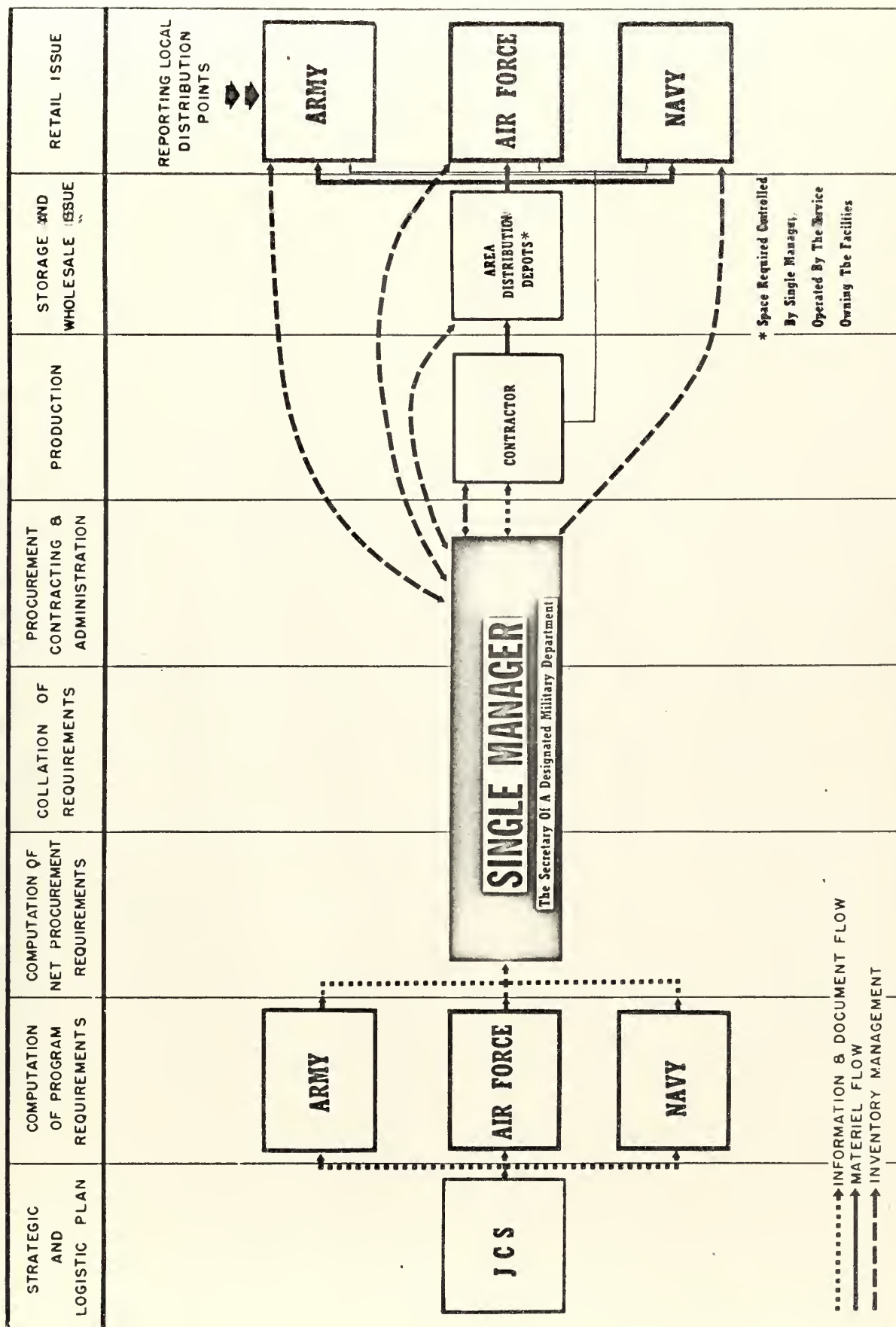
--- INFORMATION & DOCUMENT FLOW

— MATERIEL FLOW

--- INVENTORY MANAGEMENT

CHART 5.

SINGLE MANAGER SYSTEM



Determination of Requirements

It has been pointed out that the Charter for MPSA specifically excluded computation of net requirements from its responsibility. This prerogative and responsibility rests with the individual Service and is one which is jealously controlled by them. The Services point to the military commander's traditional insistence that he control his own vital logistics in order to retain authority commensurate with the responsibility for carrying out assigned missions. Consequently, the Chief of Naval Operations, based on approved JCS Strategic and Logistic Plans, establishes Navy worldwide, peacetime and Mobilization Reserve Material Stock Levels of petroleum products. Using these stock level guide lines, the Fuel Supply Office determines the net requirements for bulk and packaged items within the continental United States. Likewise, the Navy overseas stocking activities also assume the responsibility for maintaining these levels subject to review by the FSO to determine compliance with CNO levels and to determine availability of funds for procurement. No regular review of requirements is made at the DOD level. MPSA lacks authority to review service requirements for either bulk or packaged items.

Procurement

The determination of requirements, i.e., what is needed, where it is to be positioned and when, forms the basis for all procurement action. Procurement is based on the determination of requirements and like that step in the process of logistics is largely dependent upon the present, or future, availability of crude petroleum, finished petroleum products, facilities, man power, need for services, and operating requirements. Petroleum products and petroleum services procurement is big business. It commands the position of being the largest dollar expenditure for any single supply commodity within the DOD. In the past three-year period, petroleum product purchases exceeded one billion dollars each year. Transportation (tanker only) amounted to approximately one hundred million dollars per year and contracts for storage and services exceeded twenty-four million dollars per year.⁵

Some of the factors involved in the procurement of petroleum are material specification, standardization, inspection, cataloging, purchasing, priorities and allocations, and off-shore procurement. Only the latter three factors will be discussed below.

⁵Military Petroleum Supply Agency, op. cit., (n.d.)

Priorities and Allocations - Although often a source of irritation, a system of priorities and allocations are of a vital necessity in the scheduling of procurement and distribution of petroleum products. In times of emergencies, only an intelligent application of priorities and allocations can insure that the most essential petroleum needs of the military, industry and civilian economy, will receive the precedence in procurement and distribution that they deserve. Reflect for a moment that the importance of petroleum to our National Defense effort is so vital that not a wheel in Industry can turn without lubrication; the Nation's industrial capacity would be crippled without power; the Nation's transportation system would grind to a screeching halt; and our highly mobile and mechanized military might would become tactically immovable.

Priorities and allocations present no particular problem during peace time because of our industrial capability and lesser total National demands. In wartime, however, JCS formulates allocations and priorities for the military and the unified commanders exercise directive authority within their areas through the Joint Petroleum Offices structure.

Funding and Pricing - Bulk and packaged Navy procurements are initially funded by means of the

Navy Stock Fund (NSF). The Bureau of Supplies and Accounts administers the Stock Fund for products purchased under its inventory control. The typical funding cycle for a revolving fund prevails, i.e., the NSF finances procurement of items identified as Navy Stock Account material and then the Navy Stock Fund is reimbursed when final charge is made to the appropriation for end use expenditure. The major expenditure for petroleum, of course, is represented by bulk products. Inventories are minimal and can be measured in days of supply since bulk petroleum enjoys a stock turn in excess of sixteen times per annum.⁶

Just as the Navy budgets for procurement of petroleum, the other military departments likewise, but independently, also perform this function. Moreover, each Service establishes its own item standard pricing criteria which criteria, unfortunately, are not on a common basis.

Since the MPSA charter excluded the provision of stock ownership, this automatically eliminated any funding assignment consideration. MPSA does, however, have coordination control for uniform pricing

⁶Navy Fuel Supply Office Instruction 73201, Accounting Instructions for Navy Owned Bulk Fuels and Lubricant, file 20 dated 27 May 1959.

among the Services. This control has not been effective as found by the Logistics Systems Study Project committee which reported "Unnecessary differences between the Services in pricing and funding resulted in unnecessary difficulties in management."⁷

Buy American Act - For some time, military petroleum purchases have been exempt from the provisions of the Buy American Act because of the relative need in our domestic market for imported petroleum. Even with what appears to be vast, known U. S. proven reserves (1961) totalling some 31,758,505,000 barrels, our U. S. Production rate for the same year equalled a fantastic 2,512,273,000 barrels.⁸ This is less than 13 years proven reserves based on this production rate. Recall that the proven reserves in 1916 reported by the Secretary of Interior was approximately 25 years. It would appear that the worsening United States oil reserve picture would serve to demand continuance of the "Buy American" exemption.

⁷United States Congress, House of Representatives, Committee on Government Operations. Military Supply Management, Eighth Report by the Committee, Union Calender N. 277 H.R. 674, July 15, 1959. (Washington: Government Printing Office, 1959), p. 31.

⁸"U.S. Reserves Gain Modestly," The Oil and Gas Journal, March 26, 1962.

Because of industry pressure, petroleum was removed from the exemption to the Buy American Act as of 26 April 1958. MPSA reported that from that date to 31 December 1958 the added costs from domestic procurement approximated \$2.1 million.⁹ Although these savings from off shore procurement are significant, more vital is the requirement that the United States foster and develop the off shore Free World oil resources (known in 1960 to be 69% of the total Free World's proven reserves).

The need for foreign oil becomes apparent when one considers that during World War II the maximum share of the nations petroleum consumption used by the military was about 21% (austere civilian rationing was in effect). In recent peacetime years it has approximated 3% while during the Korean operation, military consumption rate rose to about 5% of the national total.¹⁰

When the requirements of petroleum for the next major war as expressed by Captain Boyd, (see page v) are compared with United States production

⁹Military Petroleum Supply Agency, Eighth Quarterly Narrative Report on the Single Manager for Petroleum Assignment, (DD-S&L (Q) 352, Washington, D. C., p. 3.

¹⁰Naval War College Review, op. cit., p. 15.

and reserves it would be disastrous to conclude from this data that a war could be fought to victory by our nation on a meager 20-25% of our total production.

And what about our Naval Petroleum Reserves - although the Navy first began acquiring petroleum reserves approximately 50 years ago its present reserve holdings are inadequate to sustain a war effort. Maximum efficient productive capacity of the Naval Petroleum reserves does not exceed 220,000 barrels per day.¹¹

It appears then that the best interests of the Nation would be served by reinstating the exemption from the Buy American act in order to encourage Free World development of off shore sources wheresoever they may be to the point that petroleum products might be available at any given time of need.

Distribution

A military distribution system is defined as "that complex of facilities, installations, methods,

¹¹This figure, representing the total daily productive capability of the Naval Petroleum Reserves located at Elk Hills, Buena Vista Hills, Teapot Dome, and Point Barrow, is derived from information and data obtained from the Hearings on H. R. 2948 et al (1953), and Hearings on Senate Joint Resolution 13 et al (1953). (Washington: Government Printing Office, 1953).

and procedures, designed to receive, store, maintain, distribute, and control the flow of military material between the point of receipt into military system and the point of issue of using activities and units."¹² Each Military Service has its own petroleum logistic distribution system overseas (modified) as well as within the United States. In continental United States the function of requirements consolidation and review, and control of distribution are separately administered by the three Service inventory control points. It wasn't until 1 March 1960 that MPSA was given full authority and responsibility to select sources of product and means of transportation to meet resupply requirement involving tanker and tanker/barge combination movements to bulk terminals worldwide.¹³ So it remains that control of the petroleum logistics system within continental United States is still divided three ways for packaged products and for bulk moved by means other than water while at the same time the system is coordinated under unified command overseas.

¹² Armed Forces Supply Support Center. Recommendation to Establish and Expand Commodity Single Management Assignments. Department of Defense, Washington, February, 1961, p. 176.

¹³ Military Petroleum Supply Agency, Memorandum from the Director. File 10 4020, Washington, D. C. January, 1960.

Overseas - At this point, however, a distinction must be made about the integrated system under unified command overseas for packaged products. In essence, two separate supply requisitioning procedures and two separate distribution channels are in effect for packaged products. As an example, within the CINCLANT Command the selected group of items appearing in the Federal Catalog C4-1 class - as shown on Chart 6, page 37, are obtained through the Unified Command, JPO replenishment channels while the remainder of packaged items are obtained by the requiring Service outside the Petroleum logistic system by the normal supply channels for other commodities.¹⁴ These special treatment items are not exclusive with CINCLANT JPO since the list is promulgated by MPSA to all JPO's.¹⁵ It is felt that special treatment for these many items contributes to conflicts and confusion under emergency conditions.

¹⁴ Commander In Chief, United States Atlantic Command, Atlantic Command Petroleum Reporting and Slatting Instructions, Serial 414/45, Norfolk, Virginia, 20 December 1960.

¹⁵ Military Petroleum Supply Agency, "Operating Procedures." Department of the Army AR 700-9100-5, Department of the Navy NAVMPSA P-1, Department of the Air Force AFR 67-142, Marine Corps NAVMC 1152 (Rev.) Washington, D. C., 31 March 1959, p. 3-2, (Ch.3).

CHART 6 37
List of Index Numbers of Petroleum packaged items in FSC Group 91 appearing in
Federal Catalog C4-1 and Change Bulletin No. 1 (C4-1CB) to be supplied
through CINCLANT channels.

330	570	945	3840	4265	4925	5170	5770
335	575	950	3845	4270	4930	5175	5775
<u>340</u>	<u>580</u>	955	3850	<u>4275</u>	<u>4935</u>	<u>5180</u>	<u>5780</u>
		<u>960</u>	<u>3855</u>				
350	585			4290	4945	5330	5785
355	590	970	3856	4295	4950	5335	5790
<u>360</u>	<u>595</u>	975	<u>3857</u>	<u>4300</u>	<u>4955</u>	<u>5340</u>	<u>5795</u>
		980	<u>3858</u>	<u>4305</u>		<u>5345</u>	
370	600	<u>985</u>			4965		5800
375	<u>605</u>		3885	4425	4970	5350	5805
380		990	3890	4430	4975	5355	<u>5810</u>
<u>385</u>	790	995	3895	<u>4435</u>	4980	5360	
	795	<u>1000</u>	<u>3900</u>		<u>4985</u>	<u>5365</u>	5820
390	<u>800</u>			4440			5825
395		1030	3905	4445	4995	5370	<u>5830</u>
400	805	1035	3910	<u>4450</u>	5000	5375	
<u>405</u>	810	1040	3920		<u>5005</u>	5380	5835
	<u>815</u>	<u>1045</u>	<u>3925</u>	4455		<u>5385</u>	5840
430				4460	5010		5845
<u>435</u>	820	1490	4055	<u>4465</u>	5015	5415	<u>5850</u>
	825	<u>1495</u>	4065		<u>5020</u>	5420	
445	<u>830</u>		<u>4075</u>	4470		<u>5425</u>	5900
450		1505		4475	5025		5905
455	<u>850</u>	1510	4080	4485	5030	5515	5910
<u>460</u>		<u>1515</u>	4090	<u>4490</u>	<u>5035</u>	5525	<u>5915</u>
	<u>875</u>		<u>4100</u>			5530	
465		1645		4845	5040	<u>5535</u>	6065
470	885	1650	4105	4855	5045		6070
<u>475</u>	890	<u>1660</u>	4115	4860	<u>5050</u>	5540	6075
	895		<u>4125</u>	<u>4865</u>		5550	<u>6080</u>
480	<u>900</u>	2080			5055	5555	
485		2085	4220	4875	5060	<u>5560</u>	6677
<u>490</u>	905	2095	4225	4880	<u>5065</u>		6678
	910	<u>2105</u>	<u>4230</u>	<u>4885</u>		5565	6679
495	915				5135	5575	6680
500	<u>920</u>	<u>3225</u>	4235	4895	5140	5580	6681
<u>505</u>			4240	4900	<u>5145</u>	<u>5585</u>	<u>6682</u>
	925	3805	<u>4245</u>	<u>4905</u>			
545	930	3810			5155	5595	
550	935	3815	4250	4910	5160	5600	
555	<u>940</u>	<u>3820</u>	4255	4915	<u>5165</u>	5605	
<u>560</u>			<u>4260</u>	<u>4920</u>		<u>5610</u>	

Dry Cleaning Solvent, T-I

6850-264-9039	bulk
6850-281-1985	1 gal can
6850-264-9038	5 gal can
6850-264-9037	55 gal dr, 16 ga.
6850-285-8012	55 gal dr, 18 ga.

Dry Cleaning Solvent, T-II

6850-274-5421	5 gal dr
6850-281-1986	55 gal dr, 16 ga.
6850-285-8011	55 gal dr, 18 ga.

If in fact special treatment efforts are required they should be directed toward strengthening the existing supply support channels rather than devising a separate, incompatible system. How better can the integrity and responsiveness of the logistic channel be improved?

It is demonstrated that the lead time for Packaged Shipment Requests (Requisitions) through the JPO*SAPO system stipulates delivery requirement for the 5th month subsequent to the date of submission of the request¹⁶ whereas the normal lead time, or shipping and order time, for other packaged petroleum products through normal supply channels is 60 days or less.¹⁷ It is axiomatic that decreased lead time improves inventory control and lessens the absolute safety level requirement for stock.¹⁸ Other

¹⁶ Ibid, p. 3-5 (Ch. 3).

¹⁷ Bureau of Supplies and Accounts Manual, Vol. II, par. 22246.

¹⁸ Note: when not considering incremental deliveries, a 3-month increase in the length of the replenishment period will have two effects on the stock level necessary for a specified amount of protection. First, the stock level must be increased by the amount of the mean expected demand for the 3-month period, and second, the safety allowance is increased by the factor - square root of the lead time.

disadvantages that arise from the separate requisitioning channels is that overseas activities are precluded from using the Rapid Data Requisitioning Transmission Procedures since this system is not currently compatible with the Petroleum logistic system; parallel requisitioning procedures are required for the same commodity group; increased administrative burden on MPSA and the Bureau for a greater number of deliveries under contract to administer; and the additional transportation costs involved in less than car lot delivery to the pre positioned tide water transshipping activity. This activity would normally be a Navy Distribution Point supporting other fleet units, activities, etc. with the same items.

Continental United States - Since the MPSA is not a full blown single Manager, the services maintain their own distribution system within the continental United States. Considerable differences on these systems exist in many aspects and a review of the philosophy of the current systems is considered appropriate.

Navy - The Navy positions stocks at activities that have sufficient demand. Major stocking points are replenished automatically based on stock status reports submitted to FSO. Satellite

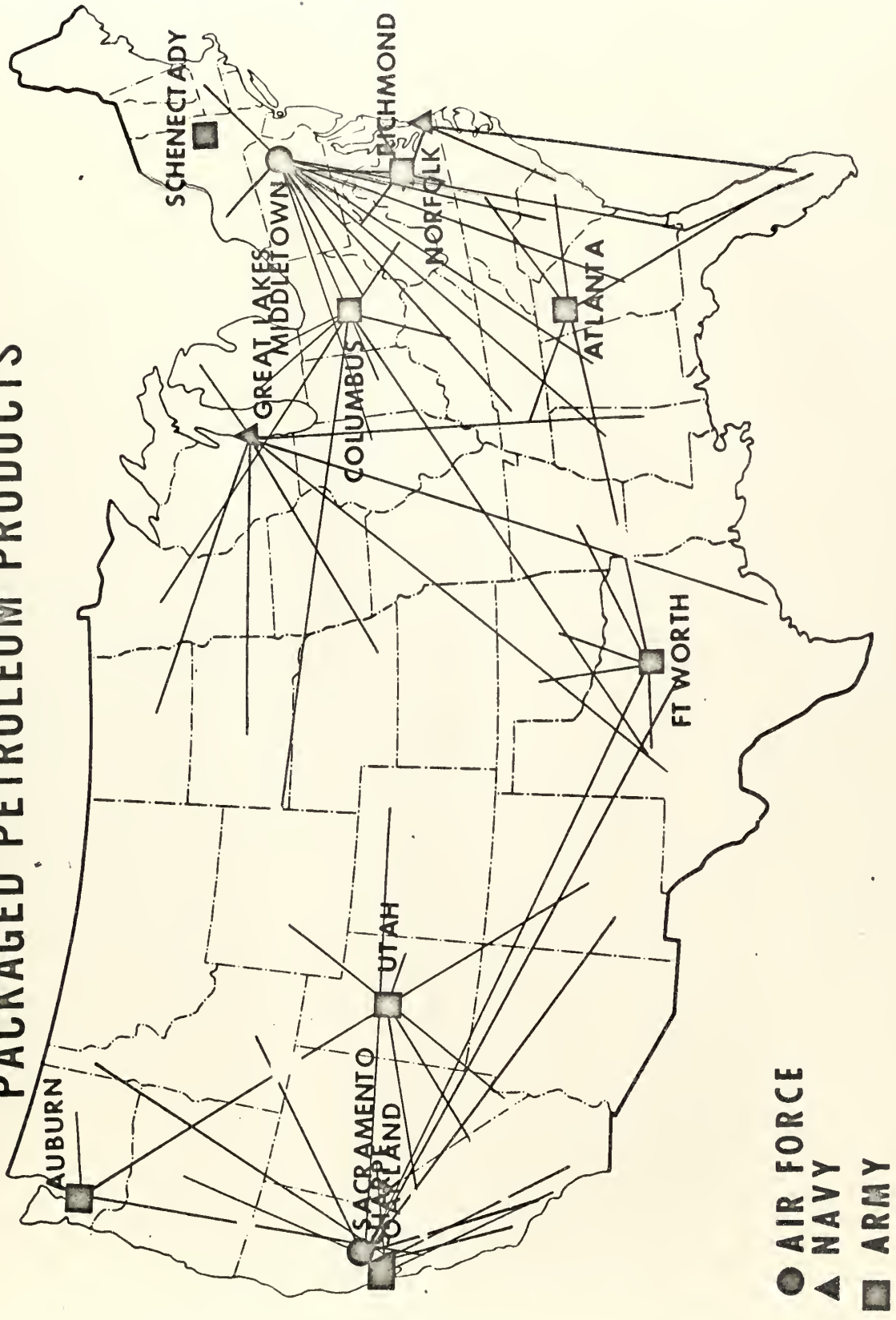
activities submit requisition on major stock points. Notable in the Navy system are its tidewater depots located to furnish maximum support to the fleet and overseas activities.

Army - This Army system is an area distribution plan in which a depot furnishes support to all customers in a geographical area. Certain depots are designated to furnish support to overseas activities. Requisitions are submitted to designated requisitioning processing points. The Army Inventory Control Point process and direct material to depots and maintains inventory control over the stocks.

Air Force - A single distribution point concept is used for all activities in the world. This point also acts as the inventory manager. Requisitions are submitted on the control depot, but stock positioning varies from a single to several points.

From the above it can be concluded that little integration of supply functions actually exists within the United States and that the present authority of MPSA serves not to eliminate duplication and overlapping. This fact is graphically presented on Chart 7, page 41, by showing the major areas of duplication within the United States. Decreasing the number of stocking points and by filling the needs of all military departments within a given geographical

CHART 7.
OVERLAP OF DISTRIBUTION AREAS
PACKAGED PETROLEUM PRODUCTS



● AIR FORCE
▲ NAVY
■ ARMY

area from the same depot and realignment of the distribution pattern will result in a reduction of long hauls, and the elimination or reduction of cross hauls and back hauls.

Cross Servicing - So significant is the unification or integration of the bulk products distribution system overseas that it merits comment. The products each Military Department is responsible for cross servicing worldwide have been allocated by mutual agreement of the Departments concerned. The major factor involved in determining these responsibilities was which Service had predominant interest in each product and also had the facilities to handle distribution.

Under this plan, in each overseas area, each product is assigned to a single Service as its responsibility for submitting requirements for purchase to MPSA and for funding the stocks for movement into the theater. The Department owning the terminal facility at which the product is stored retains ownership of such facilities and continues to operate the facilities for all three Services; maintenance and operating cost of facilities is borne by the owning Service, regardless of product ownership; replacement of product losses is made by the owning Service; and

the Service having inter-departmental supply responsibility is responsible for the determination of standard prices for products transferred to other Services. This standard price is based on the current market price plus surcharges to compensate for all foreseeable losses and first destination transportation. The Services have not agreed on a common basis for standard pricing surcharges.

Graphic representation of the extent of cross-servicing or inter-service supply support for bulk and packaged petroleum products is shown on Charts 8 and 9, pages 44 and 45.

Here we observe the marriage of two supposedly incompatible ideas - competition and cooperation - with all three Services working together and participating in providing coordinated logistic support with un-common ownership of stocks to serve each others needs.

Storage - The acquisition of storage facilities and the accumulation of stocks in advance of demands are of primary importance in maintaining balanced operations and minimizing peak loads on transportation. Adequate, dispersed storage is essential to insure maximum efficiency of bulk petroleum distribution, maximum availability, and minimum loss of stocks in the event of enemy attack. To meet these criteria

APPENDIX 1

BULK PETROLEUM INTER-SERVICE SUPPLY SUPPORT TO OVERSEAS AREAS

1 JULY 1959

	115 AVGAS	160 AVGAS	80 AVGAS	JP-4	JP-5	MOGAS	KERO	DIESEL	NAV SPEC	LUBES	AV LUBES
CINCAL											
Aleutians	AF	AF		AF	N	A		N	N		
Mainland	AF	AF	A	AF	N	A		A	N		
CINCARIB											
Panama	AF	AF	A	AF	N	A		N	N		
CINCLANT											
Antilles (1)	AF	AF	A	AF	N	A		N	N		
Azores	AF	AF		AF	N	AF	AF	AF			
Bahamas	AF			AF	N	AF	AF	AF			
Bermuda	AF	AF		AF	N	N		N	N		
Cuba	N			N	N	N		N	N		
Greenland	AF	AF	AF	AF	N	AF	AF	AF	N		
Iceland	AF	AF	AF	AF	N	AF	AF	N	N		
Labrador	AF	AF	AF	AF	N	AF	AF	AF	N		
Newfoundland	AF	AF	AF	AF	N	AF	AF	AF	N		
Vieques	N	N	N	N	N	N	N	N	N		
CINCNELM											
Dhahran	AF	AF	AF	AF	N	AF					
England	AF	AF	AF	AF	N	AF		AF	N		
Italy (Except Leghorn)	AF	AF	A	AF	N	A	A	N	N		
Leghorn	AF	AF	A	AF	N	A	A	A			
North Africa (Except Morocco)	AF	AF	AF	AF	N	AF	AF	N	N		
Turkey	AF	AF	AF	AF	N	AF	AF	AF	N		
CINCUSAFE											
Morocco	AF	AF	AF	AF	N	AF	AF	N	N		
Spain	AF	AF	AF	AF	N	AF	AF	N	N		
CINCUSAREUR											
Benelux	AF	AF	A	AF	N	A	A	A	N		
France	AF	AF	A	AF	N	A	A	A	N		
Germany	AF	AF	A	AF	N	A	A	A	N		
CINCPAC											
Hawaii (2)	AF	AF	AF	AF	N	N	N	N	N	N	N
Japan	AF	AF	A	AF	N	A	A	A	N		
Korea	AF	AF	A	AF	N	A	A	A	N		
Marianas	AF	AF	AF	AF	N	N	N	N	N		
Philippines	AF	AF	AF	AF	N	N	N	N	N		
Ryukus	AF	AF	A	AF	N	A	A	A	N		
Taiwan	AF	AF	A	AF	N	A	A	A	N		

NOTE: Does not include Aid Programs. (1) EXCEPT VIEQUES

(2) INCLUDES JOHNSTON, WAKE AND MIDWAY ISLANDS, ENIWETOK AND KWAJALEIN

APPENDIX 5

PACKAGE PETROLEUM INTER-SERVICE SUPPLY SUPPORT TO OVERSEAS AREAS

	AVFUELS		GROUND FUELS	AIR- CRAFT GREASES	OTHER GREASES	GROUND LUBRI- CATING OILS	AIRCRAFT LUBEOILS				MISC PROD- UCTS
	80 AVGAS	ALL OTHERS					100S	1010	106S	*1100	
CINICAL											
Aleutians	N	N	N	N	N	N	AF	N	N	N	N
Mainland (1)	A	AF	A	AF	A	A	AF	AF	A	AF	A
CINCARIB											
Panama (2)	A	AF	A	AF	A	A	AF	AF	A	AF	A
Rodman, C.Z.	N	N	N	N	N	N	AF	N	N	N	N
CINCLANT											
Antilles (3)	N	N	N	N	N	N	AF	N	N	N	N
Argentina	N	N	N	N	N	N	AF	N	N	N	N
Azores	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
Bahamas		AF	AF	AF	AF	AF	AF	AF		AF	AF
Bermuda	N	N	N	N	N	N	AF	N	N	N	N
Fort Buchanan, P.R.	N	AF	N	AF	N	N	AF	AF	N	AF	N
Greenland	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
Iceland	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
Labrador	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
Newfoundland (4)	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
Ramey AFB, P.R.	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
CINCEUR											
CINCUSAREUR											
Benelux	A	AF	A	AF	A	A	AF	AF	A	AF	A
France	A	AF	A	AF	A	A	AF	AF	A	AF	A
Germany	A	AF	A	AF	A	A	AF	AF	A	AF	A
CINCNELM											
Bahrein	N	N	N	N	N	N	N	N	N	N	N
Dahrgn	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
England	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
Italy (5)	N	N	N	N	N	N	AF	N	N	N	N
Leghorn	A	AF	A	AF	A	A	AF	AF	A	AF	A
Malta	N	N	N	N	N	N	N	N	N	N	N
North Africa (6)	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
Turkey (7)	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
CINCUSAFE											
Port Lyautey	N	N	N	N	N	N	N	N	N	N	N
Morocco (8)	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
Spain	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
CINCPAC											
Hawaii	N	N	N	N	N	N	AF	N	N	N	N
Japan	A	A	A	AF	A	A	AF	AF	A	AF	A
Korea	A	A	A	AF	A	A	AF	AF	A	AF	A
Marianas	N	N	N	N	N	N	AF	N	N	N	N
Philippines	N	N	N	N	N	N	AF	N	N	N	N
Ryukyus	A	AF	A	AF	A	A	AF	AF	A	AF	A
Taiwan (7)	N	N	N	N	N	N	N	N	N	N	N

(1) Includes Shemya

(2) Excludes Rodman, C.Z.

(3) Excludes Fort Buchanan, P.R. & Ramey AFB, P.R.

(4) Except Argentina

(5) Except Leghorn

(6) Except Morocco & Port Lyautey

(7) U.S. Forces excluding MAAG, CAMG, ICA & MDAP

(8) Except Port Lyautey

*AF responsible for supply of 1100 with cyclohexanone to all areas.

MPSA coordinates the storage positioning of mobilization reserve and peacetime operating stocks in accordance with DOD policies, operational needs, and with further considerations of the wartime missions of the Military Services.

In overseas areas, petroleum storage may be either military owned and operated or contracted for commercially. MPSA contracts on a worldwide basis for all commercial storage.

Planning for petroleum storage is undertaken within JCS to support the JCS Strategic and Logistic Plans. Such plans are general and detailed implementation takes place at military department level and below. Obviously, shifts in defense strategy call for corresponding shifts in strategic requirements and deliveries. Military departments in turn compute storage requirements for current consumption in accordance with policies established by Assistant Secretary of Defense (Installations and Logistics). MPSA reviews each military department's requirements for operating and reserve storage making appropriate recommendations thereon to the Assistant Secretary of Defense (I&L).

Storage facilities which may be contracted for by MPSA are the operational responsibility of the

requesting department. Where Service competition exists for available commercial storage MPSA undertakes to arbitrate the matter and then allocates storage in the manner that best meets the total military needs.

Redistribution and Disposal of Excesses -

Redistribution of petroleum products occurs whenever action is initiated by an Inventory Control Point to transport material from the initial first destination delivery point to lower echelon stocking points or consumption activities. Redistribution may occur as the result of excesses or through normal supply support channels and obviously should be undertaken only when the advantages are considered with respect to the urgency of need and the other criteria of expense involved in relocating excesses. Again, since MPSA does not have wholesale stock ownership, redistribution is the responsibility of the individual Service Inventory Control Points. MPSA enters into redistribution of Service assets only upon the request of the Services when they report releaseable, excess assets; overseas, only on agreement of the area commander and only after coordination with the interested military departments. As indicated elsewhere in this paper, MPSA does not have authority to

review Service requirements, receives no inventory control stock status reports and therefore is in no position to determine excess Service stocks unless such stocks are reported by the Services involved. The situation may well arise then where one Service under its own authority may be redistributing from one distribution area to another, while a second Service may be purchasing to fill needs in that area where the excess existed.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Nearly a half century has elapsed since the Navy was initially beset with the problem of assured fuel oil supply and its related distribution. The problem existed then and it exists today - expressed in modern day parlance this involves the need for a militarily responsive petroleum logistic system bounded by the parameters of resource constraints, international political involvements, the impact of the tremendous increase in military requirements for petroleum on the national productive capability and the need for economy in arriving at the solution to the equations of this matrix.

The basic feasible solution evolves around the paramount consideration of a dependable, responsive and an economical petroleum logistic system. That the existing system is dependable and responsive has no quarrel. MPSA's successful performance during the world apart, conflagrations of the Lebanon and Formosa crises in 1958; the more recent crises in VietNam; and the Congo, in meeting the instantaneous increased demands for petroleum creditably

demonstrated this capability. Further evidence of MPSA's effectiveness is supported by the statements of the DOD Review Panel, Commodity Single Manager Evaluation Study, which indicated, "Supply effectiveness to Military departments approached 100%; customer satisfaction high; and that all departments have commented favorably on the MPSA's procurement effectiveness."¹ This study was undertaken by the DOD, involving the Joint Staff of JCS to arrive at definitive conclusions concerning the efficacy of the Single Manager Plan for petroleum, in peace and war, on the basis of sustained performance. Admittedly, the current procurement organization has not undergone the true test of readiness required of a major war effort.

The final criterion which must be satisfied is the one of economy. Dependability and responsiveness, unquestionably over-ride considerations of economy during war time; however, no nation, either in peace or war, can totally disregard the basic theories of economics - the allocation of scarce resources. The less resources required for support

¹Hearings, 86th Congress, op. cit., pp. 107-11.

of a military operation in terms of logistics the more resources become available for research and development pursuit; for procurement of military hardware - the means with which to defend; and for allocation to civilian consumption. The need for economy of operations cannot be disputed. It is illustrated as the expressed purpose and objectives of several DOD organizations cited in previous chapters starting with SECDEF and extends to the consumer. How well does our petroleum logistic system fare in this regard?

It is not difficult to unveil numerous shortcomings in military petroleum supply operations. These have been enumerated as over stocking, duplication of stock at one or more sources, procurement of items already in long supply, duplication of facilities; procurement of items held by another Service as excess, cross hauling, and back hauling - to name a few.

It is less difficult to realize that these deficiencies surely arise because of the independent inventory control, wholesale stock ownership, and direct control over distribution system responsibilities retained by the individual Services. (Recall that these were excluded from the original proposed Single Manager Plan for petroleum.)

The significant economies achieved by other Single Managers that are fully integrated had been derived from the elimination of concurrent buying and selling, reduction of cross hauls and back hauls through more integrated distribution, payroll reductions, better procurement operations and stimulation of down turn in inventory levels.² Why not the Single Manager for Petroleum also?

Yes! Why not petroleum also? The Services maintain that petroleum is considered as too vital a commodity to be placed more fully under single management,³ and that the military commander must control his own logistics to insure responsiveness in accomplishing his mission. Do these arguments "hold water" in light of (1) the effective, extensive cross servicing being accomplished overseas, and (2) under wartime conditions the very control the military commander has over his logistics and resources is reverted to sensible priorities and allocations control under JCS. The Service argumentative points appear not well founded.

² Military Supply Management, op cit., p. 42.

³ Ibid, p. 28.

The very strength, support, and control which the Single Manager for Petroleum requires to achieve a more economical operation has been sapped by the Services. MPSA has demonstrated its dependability and responsiveness now it needs additional tools to enable it to do its job most efficiently. These tools, as additional responsibilities, include:

1. ownership of wholesale stocks.
2. direct control over the petroleum distribution system.
3. complete inventory control responsibility for all products to include computation of net requirements, funding and pricing.

Directive control in these areas in lieu of the present ineffective coordination responsibilities would provide:

1. automatic coordination as against voluntary cooperation of the Services.
2. immediate policy directives as against channeled agreements with respective agencies.
3. direct maintenance and availability of data as against informally exchanged data between Services.

Recommendations

The potential for a fully integrated agency has never been greater than at this point in the evolution of the petroleum logistics system. The technological break-through of digital computers and the automatic data processing systems with inter-related high speed transceiver systems provide not only the means for centralized large scale operations but also serves as additional justification for the implementation of the integrated, centralized operation.

In order to successfully conclude this integration the following recommendations are submitted:

1. Assignment of whole stock ownership to the agency. This would include wholesale stocks of both bulk and packaged products within the continental United States, tanker cargoes and wholesale stocks of bulk products at terminal facilities overseas. Bulk stocks at station level should be owned by Services and charged to end use expenditure where very high turnover rates exist. Services should, however, retain this final determination but such selection should preclude stock funding of station stocks.

2. Assignment of funding and pricing policies to the agency. Services would budget only for retail funding of minimal packaged products and also for end use appropriation.
3. Assignment of responsibilities for determination of wholesale distribution points within continental United States to the agency. This includes assignment of distribution pattern to the Services.
4. Assignment of inventory control responsibilities to the agency, including net requirements determination. Military Departments would compute program requirements and mobilization reserves based on JCS Strategic and Logistic Plans for inclusion in net requirements by the agency.
5. Assignment of responsibility for strategically positioning mobilization reserve stocks based on JCS location determination to the agency.
6. The agency should prepare and submit to the Joint Staff, JCS, regular periodic stock reports for monitoring and evaluating the agency's performance against 4. and 5. above.

7. Modify the overseas distribution system for packaged products to the normal supply channels for regular commodity support:
Remove JPO out of the packaged petroleum logistic system except to receive regular periodic inventory reports from SAPOs for monitoring purposes. JPO retain staff responsibilities for packaged products.
8. Military departments continue to own and operate bulk terminals, within continental United States and overseas - and to have responsibility for stock losses except those incurred because of normal tank cleaning.
9. That DOD pursue efforts to get petroleum excluded from the provisions of the Buy American Act.

Future of the Petroleum Logistic System

The future of the Petroleum Logistic System now appears to be in the hands of the Defense Supply Agency (DSA). This agency evolved directly from SECDEF's famous "Project 100" and was adopted from three alternative plans presented as long term blueprints for organizing and managing common supplies and services among the military departments.

In a nutshell, Plan I proposed continuing the Single Manager Operating Agency method - but with improvements: Plan II suggested a single consolidated agency vested in one of the military departments; Plan III, the one adopted, called for a single agency outside the military departments that would report directly to SECDEF.

With the establishment of DSA another milestone has been created in the petroleum logistic system as the Military Petroleum Supply Agency has been redesignated the Defense Petroleum Supply Center (DPSC) effective 1 January 1962.⁴ To date, the revised DPSC charter has not been promulgated. As with MPSA, DPSC does not now have any supply management, stock control or financial management functions whatsoever. It is understood that the major change in the process of being incorporated in the DPSC charter is the assignment of packaged petroleum products management to DPSC. This is a step forward; however, integration cannot be considered complete until such time as the responsibilities enumerated above, along with commensurate authority to accomplish them, have been assigned to DPSC.

⁴Defense Supply Agency, "General Order No. 2," dated 20 December 1961

In my opinion, no agency which has major logistical responsibilities can function most effectively without positive provision for directive control. Only when such action is final will our militarily responsive and dependable petroleum logistic system be in a position to most economically do its job of providing petroleum support to our fighting forces.

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THEORY

1. The first part of the theory is the definition of the function $f(x)$ of a real variable x .

Let x be a real number. A function $f(x)$ is a rule which assigns to each x a unique real number $f(x)$.

The domain of the function $f(x)$ is the set of all real numbers x for which $f(x)$ is defined.

2. LIMITS

Let $f(x)$ be a function defined on a set S . Let a be a real number. We say that $f(x)$ approaches the limit L as x approaches a if for every $\epsilon > 0$ there is a $\delta > 0$ such that $|f(x) - L| < \epsilon$ whenever $|x - a| < \delta$ and $x \in S$.

The limit of $f(x)$ as x approaches a is denoted by $\lim_{x \rightarrow a} f(x) = L$. If $L = \infty$ or $L = -\infty$, we say that $f(x)$ approaches ∞ or $-\infty$ as x approaches a .

Let $f(x)$ be a function defined on a set S . Let a be a real number. We say that $f(x)$ is continuous at a if $\lim_{x \rightarrow a} f(x) = f(a)$.

The function $f(x)$ is continuous on a set S if it is continuous at every point a in S .

The function $f(x)$ is differentiable at a if the limit $\lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$ exists.

The derivative of $f(x)$ at a is denoted by $f'(a)$. The derivative of $f(x)$ is denoted by $f'(x)$.

The function $f(x)$ is differentiable on a set S if it is differentiable at every point a in S .

The function $f(x)$ is differentiable on a set S if and only if $f'(x)$ exists on S .

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